

# Mitochondrial Physiology

## MiP2013

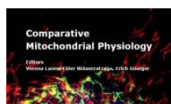
9<sup>th</sup> MiPconference

# Comparative Mitochondrial Physiology

MiP2013, Obergurgl, Tyrol, Austria  
23 – 27 Sep 2013

## Programme

Session		Section	Page
	Sept-23	MiP2013 Opening	P2
	Sept-24	Keynote by Professor Sir John E Walker	P2
1	Sept-24	MiP <i>comparative</i> : Oxygen delivery and muscle OXPHOS	A1 P2
2		MiP <i>comparative</i> : Oxygen delivery and muscle OXPHOS	A1 P3
3		MiP <i>comparative</i> : Hypometabolism and mt-diversity	A2 P3
4		MiP <i>comparative</i> : Temperature - a hot MiPchallenge	A3 P3
5	Sept-25	MiP <i>pathology</i> : Diabetes and obesity – general	C1 P4
6		MiP <i>pathology</i> : Tissue differences in diabetes - mouse and rat models	C2 P4
7		MiP <i>pathology</i> : Ageing, neurodegeneration, inherited	C3 P5
8	Sept-25	MiP <i>regulatory</i> : Sulfide and structure	B1 P5
9		MiP <i>regulatory</i> : Calcium, potassium and topics of regulation	B2 P5
10	Sept-26	MiP <i>pathology</i> : Inflammation, ischemia-reperfusion, cancer	C4 P6
11		MiP <i>pathology</i> : Diagnosis	C5 P6
12		MiP <i>pathology</i> : Treatment	C6 P6
		Posters	P7
		List of participants	P9
	Sept-25	General assembly	P15
		Bioblast alert – MiP2013 - MiPMap	P16



Page numbers in the following programme refer to the Book of Abstracts: Laner V, Bidaurratzaga E, Gnaiger E, eds (2013) Comparative mitochondrial physiology. MiP2013. Mitochondr Physiol Network 18.08: 96 pp.

## Programme



**10+5 min presentations:** Speakers will receive a MiP2013 present if (i) 10 (max. 12) **BEST slides** were selected, (ii) slides were readable from the far back, and (iii) transmission of the key message for MiP is completed within **600 s** (use of SI units is encouraged). +5 min will be reserved for discussions. This will particularly give poster presenters an additional opportunity to point out connections to their related messages.

### Monday, Sept 23

Arrival		
19:30	<i>Dinner</i>	
<b>21:05</b>	<b>MiP2013 Opening</b> Chairs: Vilma Borutaite, Flemming Dela	<b>Abstracts</b> Sect Page
<b>21:15 - 21:45</b>	<b>Erich Gnaiger</b> What is mitochondrial physiology – why comparative?	6



### Tuesday, Sept 24 Morning

<b>08:50</b>	Chairs: Vladimir Skulachev, Anibal Vercesi	
<b>09:00 - 09:30</b>	<b>Keynote by Professor Sir John E Walker</b> <b>Generating the fuel of life.</b>	8
<b>Session 1</b>	<b>MiPcomparative: Oxygen delivery and muscle OXPHOS -</b> dedicated to Kjell Johansen	9
<b>A1</b>		
<b>09:30</b>	Chairs: James F Staples, Pablo Garcia-Roves	
<b>09:35 - 10:00</b>	<b>Weber RE - Kjell Johansen lecture</b> Hemoglobins: Molecular adaptations safeguarding mitochondrial O <sub>2</sub> supply	<u>A1-01</u> 10
<b>10:05</b>	<i>Coffee / Tea - Poster viewing</i>	
<b>11:00 - 11:10</b>	<b>Scott GR</b> Mitochondrial adaptations to hypoxia in high-altitude birds and mammals	<u>A1-02</u> 11
<b>11:15 - 11:25</b>	<b>Chicco AJ</b> Comparative muscle mitochondrial physiology of the northern elephant seal	<u>A1-03</u> 11
<b>11:30 - 11:40</b>	<b>Gnaiger E</b> Biochemical coupling efficiency in permeabilized fibres from arm and leg muscle in Inuit versus Caucasians: A functional test of the uncoupling hypothesis in Greenland	<u>A1-04</u> 12
<b>11:45 - 11:55</b>	<b>Boushel RC</b> O <sub>2</sub> delivery, diffusion and mitochondrial respiration components of V <sub>O2</sub> during exercise in health and disease	<u>A1-05</u> 13
<b>12:00 - 12:10</b>	<b>Lundby C</b> The effects of hypoxic training on aerobic performance in normoxia and moderate hypoxia: a randomized, double blind, placebo controlled study	<u>A1-06</u> 14
<b>12:15</b>	<i>Lunch - walk &amp; talk</i>	



## Tuesday, Sept 24 Afternoon

<b>Session 2</b>	<b>MiPcomparative: Oxygen delivery and muscle OXPHOS -</b>		
<b>A1</b>	dedicated to Kjell Johansen		
<b>15:25</b>	Chairs: Dominique-Marie Votion, Dominik Pesta		
<b>15:30 - 15:40</b>	<b>Jacobs RA</b>		
	Improvements in exercise performance with high-intensity interval training are facilitated by an increase in skeletal muscle mitochondria content	<a href="#">A1-07</a>	14
<b>15:45 - 15:55</b>	<b>Larsen S</b>		
	Skeletal muscle respiration after high intensity training	<a href="#">A1-08</a>	15
<b>16:00 - 16:10</b>	<b>Schiffer TA</b>		
	Dietary inorganic nitrate reduces basal metabolic rate in man	<a href="#">A1-09</a>	16
<b>16:15 - 16:25</b>	<b>Larsen FJ</b>		
	Human mitochondria has a unique response to ischemia reperfusion injury compared to mitochondria from rat, mouse and pig	<a href="#">A1-10</a>	16
<b>16:30 - 16:40</b>	<b>Heidler J</b>		
	Functional plasticity of interfibrillary mitochondria as cardiac response mechanism to stress	<a href="#">A1-11</a>	17
<b>16:45</b>	<i>Coffee / Tea - Poster viewing</i>		
<b>Session 3</b>	<b>MiPcomparative: Hypometabolism and mt-diversity -</b>		
<b>A2</b>	dedicated to Peter Hochachka		20
<b>17:25</b>	Chairs: Patricia M Schulte, Pierre U Blier		
<b>17:30 - 17:55</b>	<b>Buck LT - Peter Hochachka lecture</b>		
	The role of mitochondria in low oxygen signaling in anoxia-tolerant turtle brain	<a href="#">A2-01</a>	21
<b>18:00 - 18:10</b>	<b>Hand SC</b>		
	Defense against ATP depletion during the energy-limited state of diapause	<a href="#">A2-02</a>	22
<b>18:15 - 18:25</b>	<b>Staples JF</b>		
	Mechanisms of mitochondrial metabolic depression in hibernation	<a href="#">A2-03</a>	23
<b>18:30 - 18:40</b>	<b>Darveau CA</b>		
	Diversity and evolution of mitochondrial metabolism: Proline as a metabolic reward for pollinators	<a href="#">A2-04</a>	24
<b>19:00</b>	<i>Dinner</i>		
<b>Session 4</b>	<b>MiPcomparative: Temperature - a hot MiPchallenge</b>		
<b>20:40</b>	<b>A3</b>	Chairs: Steven C Hand, H��l��ne Lemieux	
<b>20:45 - 20:55</b>	<b>Dzialowski EM</b>		
	Mitochondrial function and the development of endothermy in the precocial Pekin duck ( <i>Anas pekin</i> )	<a href="#">A3-01</a>	29
<b>21:00 - 21:10</b>	<b>Blier PU</b>		
	Holding our breath in our modern world: are mitochondria keeping the pace with global changes?	<a href="#">A3-02</a>	30
<b>21:15 - 21:25</b>	<b>Schulte P</b>		
	The effect of low-temperature acclimation on mitochondrial function in the common killifish ( <i>Fundulus heteroclitus</i> ), a top-down elasticity analysis	<a href="#">A3-03</a>	31

21:30 - 21:40	<b>Hickey AJ</b>	Mitochondria in a changing climate? The role of mitochondrial in hyperthermic heart failure in different fish species	<u>A3-04</u>	32
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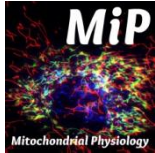
## Wednesday, Sept 25 Morning

<b>Session 5</b>		<b>MiPathology: Diabetes and obesity – general</b>		
08:25	<b>C1</b>	Chairs: Irina G Shabalina, Marcus F Oliveira		
08:30 - 08:40	<b>Lee HK</b>	Building the mitochondrial medicine; need to define mtDNA variations and its function	<u>C1-01</u>	48
08:45 - 08:55	<b>Dela F</b>	Statins affects skeletal muscle mitochondrial respiration	<u>C1-02</u>	49
09:00 - 09:10	<b>Wright L</b>	Calcium regulation of metabolism in adipocytes	<u>C1-03</u>	49
09:15 - 09:25	<b>Palm F</b>	Role of mitochondria function for the onset and progression of kidney disease	<u>C1-04</u>	50
09:30	<i>Coffee / Tea - Poster viewing</i>			
<b>Session 6</b>		<b>MiPathology: Tissue differences in <i>diabetes</i> - mouse and rat models</b>		
10:10	<b>C2</b>	Chairs: Fredrik Palm, Juliana Heidler		
10:15 - 10:25	<b>Shabalina IG</b>	Comparative study of brown and white adipose tissue mitochondria in mice upon cold acclimation	<u>C2-01</u>	53
10:30 - 10:40	<b>Irving BA</b>	Sex differences in murine mitochondrial oxidative capacity following a 24 week high-fat diet	<u>C2-02</u>	54
10:45 - 10:55	<b>Garcia-Roves PM</b>	Mitochondrial respiration in different mouse tissues under patho-physiological states	<u>C2-03</u>	55
11:00 - 11:10	<b>Quistorff B</b>	With type 2 diabetes mitochondrial dysfunction develops earlier in liver than in rat skeletal muscle	<u>C2-04</u>	56
11:15 - 11:25	<b>Kotwica AO</b>	Mitochondrial respiration in heart and soleus of ob/ob mice	<u>C2-05</u>	56
11:30 - 11:40	<b>Holloway GP</b>	Tissue specific changes in respiratory substrate kinetics in the ZDF rat and in response to resveratrol supplementation	<u>C2-06</u>	57
11:45 - 11:55	<b>Lemieux H</b>	Early mitochondrial dysfunction associated with type 2 diabetes mellitus in the heart and skeletal muscle	<u>C2-07</u>	58
12:00	<i>Lunch - short walk &amp; talk; one-on-one poster timing</i>			



## Wednesday, Sept 25 Afternoon

<b>Session 7</b>		<b>MiPathology: Ageing, neurodegeneration, inherited</b>	
<b>14:25</b>	<b>C3</b>	Chairs: Gizatullina Zimfira, Anthony J Hickey	
<b>14:30 - 14:40</b>	<b>Munro D</b>	Mitochondrial membrane of the longest-lived metazoan ( <i>Arctica islandica</i> ) are lipoxidation-resistant	<u>C3-01</u> 60
<b>14:45 - 14:55</b>	<b>Brandt T</b>	Structure and function of aged mouse mitochondria	<u>C3-02</u> 61
<b>15:00 - 15:10</b>	<b>Tretter L</b>	The effects of methylmalonic acid on alpha-ketoglutarate supported oxidation in isolated brain, heart and liver mitochondria	<u>C3-03</u> 62
15:15		<i>Break</i>	
<b>Session 8</b>		<b>MiPregulatory: Sulfide and structure</b>	
<b>15:30</b>	<b>B1</b>	Chairs: Kersti Tepp, Petr Jezek	
<b>15:35 - 15:45</b>	<b>Bouillaud F</b>	Adaptation of colonocyte mitochondria to intense hydrogen sulfide exposure	<u>B1-01</u> 35
<b>15:50 - 16:00</b>	<b>Calzia E</b>	Studying mitochondrial effects of sulfide. Does the species matter?	<u>B1-02</u> 36
<b>16:05 - 16:15</b>	<b>Jezek P</b>	Antioxidant synergy of mitochondrial uncoupling protein UCP2 and phospholipase iPLA2 $\gamma$	<u>B1-03</u> 38
<b>16:20 - 16:30</b>	<b>Plecita-Hlavata L</b>	Mitochondrial network and cristae remodeling upon hypoxia	<u>B1-04</u> 39
16:35		<i>Coffee / Tea - Poster viewing</i>	
<b>Session 9</b>		<b>MiPregulatory: Calcium, potassium and topics of regulation</b>	
<b>17:10</b>	<b>B2</b>	Chairs: Frédéric Bouillaud, Mariusz Wieckowski	
<b>17:15 - 17:25</b>	<b>Vercesi AE</b>	Mitochondrial calcium transport in animal, plant and trypanosomes	<u>B2-01</u> 41
<b>17:30 - 17:40</b>	<b>Gellerich FN</b>	The mitochondrial gas pedal, a unique property of neurons exists also in heart and skeletal muscle but not in astrocytes. New evidences by <i>in silico</i> investigations and (patho-)physiological consequences	<u>B2-02</u> 41
<b>17:45 - 17:55</b>	<b>Tepp K</b>	Bioenergetic aspects of postnatal development of cardiac cells: formation of structure-function relationship	<u>B2-03</u> 43
<b>18:00 - 18:10</b>	<b>Korzeniewski B</b>	Regulation of oxidative phosphorylation during work transitions in various tissues results from its kinetic properties	<u>B2-04</u> 44
<b>18:15 - 18:25</b>	<b>Oliveira MF</b>	Comparative mitochondrial physiology in blood feeding insect vectors and parasites	<u>B2-05</u> 45

18:30 - 19:30 **Poster session - programme page 7**


**Poster guides:** **A1-A3:** Charles A Darveau & Kotwica Aleksandra; **B1-B2:** Enrico Calcia & Lauren Wright; **C1-C2:** Adam J Chicco & Stine Lundby; **C3-C4:** Robert C Boushel & Lydie Plecita-Hlavata; **C5-C6:** Andrey Kozlov & Lauren Sparks

19:30

*Dinner*

21:00 - 21:45

**General Assembly of the MiPsociety - programme page 15**


## Thursday, Sept 26 Morning

<b>Session 10</b>	<b>MiPathology: Inflammation, ischemia-reperfusion, cancer</b>		
<b>08:55 C4</b>	Chairs: Nivea D Amoedo, Antonio Galina		
<b>09:00 - 09:10</b>	<b>Kozlov A</b>	Regulatory role of mitochondrial ROS upon Inflammation	<u>C4-01</u> 68
<b>09:15 - 09:25</b>	<b>Dungel P</b>	Iron-mediated injury of mitochondria is attenuated by nitrite	<u>C4-02</u> 69
<b>09:30 - 09:40</b>	<b>Borutaite V</b>	Mitochondrial response to heart and brain ischemia	<u>C4-03</u> 70
<b>09:45 - 09:55</b>	<b>Arandarcikaite O</b>	The protective effect of NO against ischemia induced brain mitochondrial injury	<u>C4-04</u> 71
10:00	<i>Coffee / Tea - Poster viewing</i>		
<b>Session 11</b>	<b>MiPathology: Diagnosis</b>		
<b>10:40 C5</b>	Chairs: Helena C Oliveira, Werner Koopman		
<b>10:45 - 10:45</b>	<b>Amoedo ND</b>	Comparative biochemistry of tumorigenesis: role of mitochondria	<u>C5-01</u> 75
<b>11:00 - 11:10</b>	<b>Pichaud N</b>	Importance of mitochondrial haplotypes in the expression of metabolic phenotypes under different conditions	<u>C5-02</u> 76
<b>11:15 - 11:25</b>	<b>Votion DM</b>	The challenge of understanding myopathies in horses using permeabilized and cultured equine muscle cells	<u>C5-03</u> 76
<b>11:30 - 11:40</b>	<b>Wieckowski MR</b>	Mitochondrial bioenergetic parameters, reactive oxygen species production and the status of antioxidant defense system can be used to differentiate mitochondrial defects studied in the fibroblasts from patients with various mitochondrial disorders	<u>C5-04</u> 78
<b>11:45 - 11:55</b>	<b>Wojtala A</b>	Comparative studies of reactive oxygen species production and the level of antioxidant defense system in the fibroblasts derived from patients with defined mitochondrial disorders	<u>C5-05</u> 78
12:00	<i>Lunch – MiPexcursion</i>		



## Thursday, Sept 26 Afternoon

<b>Session 12</b>		<b>MiPathology: Treatment</b>	
<b>17:25</b>	<b>C6</b>	Chairs: Hong Kyu Lee, Graham P Holloway	
<b>17:30 - 17:40</b>	<b>Skulachev VP</b>	SkQ1, the first tool to treat ROS-induced mitochondrial pathologies, which is available in drugstores	<u>C6-01</u> 82
<b>17:45 - 17:55</b>	<b>Koopman WJ</b>	Developing novel treatment strategies for mitochondrial disease	<u>C6-02</u> 83
<b>18:00 - 18:10</b>	<b>Szibor M</b>	Expression of <i>Ciona intestinalis</i> alternative oxidase in mouse	<u>C6-03</u> 84
<b>18:15 - 18:25</b>	<b>Subrtova K</b>	Hypothetical trypanosoma protein helps to anchor the F1-ATPase moiety to the mitochondrial membrane	<u>C6-04</u> 85
<b>18:30 - 18:40</b>	<b>Menze MA</b>	Group1 LEA protein ameliorates inhibition of mitochondrial respiration in <i>Drosophila melanogaster</i> Kc167 cells and isolated mitochondria	<u>C6-05</u> 86
<b>18:45 - 18:55</b>	<b>Galina A</b>	Effects of antitumor alkylating agent 3-bromopyruvate on energy transducing pathways in hepatoma HepG2, liver mitochondria and SERCA: Is there any role for mitochondrial hexokinase activity	<u>C6-06</u> 87
19:15	<i>MiP2013 Dinner</i>		
<b>21:00 - 21:45</b>	<b>Poster awards</b> – presented by Sir John E Walker, Vladimir P Skulachev, Anibal E Vercesi, Erich Gnaiger. <b>General discussion - conclusions</b>		

## Friday, Sept 27

### Departure

*Breakfast - Departure*

## Posters

<b>Chicco AJ</b>	Remodeling of skeletal muscle mitochondria in response to exercise training in taz shRNA mouse model of human Barth syndrome	<u>A1-12</u>	18
<b>Cavalcanti de Albuquerque JP</b>	Skeletal muscle mitochondrial function in ovariectomized rats: a time course study and the role of estrogen replacement	<u>A1-13</u>	19
<b>Salin K</b>	Mitochondrial functioning, a proximate mechanism underlying the pace of life?	<u>A2-05</u>	24
<b>Slinde E</b>	Comparative study of respiration in Atlantic salmon ( <i>Salmo salar</i> , L.) cells and mitochondria from blood, heart, liver, muscle and brain	<u>A2-06</u>	25
<b>Krumschnabel G</b>	Tissue homogenates for respiratory OXPHOS analysis in comparative mitochondrial physiology: mouse and trout – heart and liver	<u>A2-07</u>	26
<b>Christen F</b>	Thermal sensitivity of mitochondria from arctic charr heart: Mitochondrial respiration and ROS production.	<u>A3-05</u>	33

<b>Severin F</b>	Mitochondrially-encoded protein Var1 promotes loss of respiratory function in <i>Saccharomyces cerevisiae</i> under stressful conditions	<u><a href="#">A3-06</a></u>	34
<b>Blaskova A</b>	Distribution of nucleoids of mitochondrial DNA	<u><a href="#">B1-05</a></u>	40
<b>Hashimi H</b>	Ancestral function of Letm1 as determined in the evolutionary diverged <i>Trypanosoma brucei</i>	<u><a href="#">B2-06</a></u>	46
<b>Shigaeva M</b>	The role of mitochondrial ATP-dependent potassium channel in the adaptation of organism to stress	<u><a href="#">B2-07</a></u>	46
<b>Friederich-Persson M</b>	Potassium controls rat mitochondria function; in vivo and in vitro considerations	<u><a href="#">B2-08</a></u>	47
<b>Persson P</b>	The effects of Angiotensin II on mitochondrial respiration: A role of normoglycemia versus hyperglycemia	<u><a href="#">C1-05</a></u>	51
<b>Oliveira HC</b>	Intermittent fasting improves oxidative stress but not metabolic disturbances and atherosclerosis in hypercholesterolemic mice	<u><a href="#">C1-06</a></u>	51
<b>Garcia-Rivas G</b>	Regulation of mitochondrial permeability transition by Sirt3-catalyzed cyclophilin D deacetylation and its relevance for ventricular dysfunction in metabolic syndrome	<u><a href="#">C1-07</a></u>	52
<b>Pajuelo-Reguera D</b>	Some mitophagy markers in liver and skeletal muscle in Goto Kakizaki rats	<u><a href="#">C2-08</a></u>	59
<b>Bir A</b>	$\alpha$ -Synuclein mediated alterations in mitochondrial oxidative phosphorylation system: implications in the pathogenesis of Parkinson's disease	<u><a href="#">C3-05</a></u>	64
<b>Sonkar VK</b>	Platelets, amyloid beta and mitochondrial respiration	<u><a href="#">C3-06</a></u>	64
<b>Hendricks E</b>	Bioenergetics of permeabilized and intact nerve cell terminals from ApoE deficient and wild type mice	<u><a href="#">C3-07</a></u>	65
<b>Lindenberg K</b>	Similar alterations in mitochondrial proteome of brain and skeletal muscle in two transgenic mouse models for Huntington's disease	<u><a href="#">C3-08</a></u>	66
<b>Petit PX</b>	The cardiolipin defect linked to a tafazzin mutation in Barth syndrome disturbs mitochondrial metabolism, alters apoptosis and autophagic fluxes but does not affect cell cycle progression	<u><a href="#">C3-09</a></u>	67
<b>Makrecka M</b>	The accumulation of long chain acyl-carnitines is a major cause of mitochondrial damage during ischemia	<u><a href="#">C4-05</a></u>	72
<b>Zelenka J</b>	Reverse carboxylation glutaminolysis in breast cancer cells	<u><a href="#">C4-06</a></u>	73
<b>Zelenka J</b>	Response of cancer cells to mitochondrial DNA damage	<u><a href="#">C4-07</a></u>	74
<b>Pecina P</b>	The use of lymphocytes for diagnostics of mitochondrial oxidative phosphorylation disorders	<u><a href="#">C5-06</a></u>	79
<b>Suski JM</b>	Oxidative damage of proteins and the status of antioxidant enzymes in autopsy material from the central nervous system of patients with diagnosed or highly probable mitochondrial diseases	<u><a href="#">C5-07</a></u>	80
<b>Matallo J</b>	Effects of mechanical ventilation after blunt chest trauma on diaphragmatic mitochondrial respiration in chronically cigarette smoke exposed mice: a clinically relevant model?	<u><a href="#">C5-08</a></u>	80
<b>Beach A</b>	Lithocholic acid delays aging in yeast and exhibits an anti-tumor effect in human cells by altering mitochondrial composition, structure and function	<u><a href="#">C6-07</a></u>	88



<b>Rodrigues MF</b>	Studies of bioenergetics alterations in breast cancer cell lines induced by histone desacetylase inhibitors	<u>C6-08</u>	89
<b>Eira da Costa AC</b>	Drosophila Trap1 protects against mitochondrial dysfunction in a PINK1/parkin model of Parkinson's disease	<u>C6-09</u>	90
<b>Volska K</b>	The inhibitor of L-carnitine biosynthesis protects brain mitochondria against anoxia-reoxygenation injury	<u>C6-10</u>	91
<b>Gorbacheva O</b>	Cyclization of potassium in rat liver mitochondria in the functioning mitochondrial ATP-dependent potassium channel and its possible role in cardioprotection	<u>C6-11</u>	92

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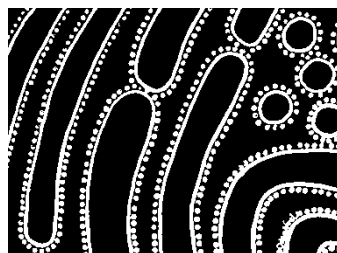
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MiP Art by Odra Noel

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**General assembly of the MiP society**

**MiP2013**

**Date and time:** Wednesday, 25<sup>th</sup> September 2013, 09:00 - 09:45 pm  
**Location:** Lecture Hall at the University Conference Centre, Obergurgl

**Topics**

1. Report of the Chair
2. Report of the Treasurer
3. Vote on general approval
4. Election of the MiPboard (<http://www.mitophysiology.org/?MiP-board>)
5. Special Issue: Comparative Mitochondrial Physiology
6. Upcoming MiPevents
7. Miscellaneous

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**MiP support**

**MiP2013**



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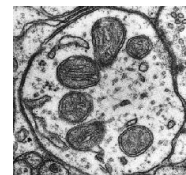
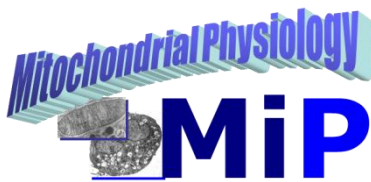


HypOxiaNet



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**MiPcooperation**



**MIG**

Mitochondria Interest Group  
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**Mitochondrial Global Network – MitoGlobal**



**[www.bioblast.at/index.php/Mitochondrial Global Network](http://www.bioblast.at/index.php/Mitochondrial_Global_Network)**

the world-wide information platform for scientific mitochondrial organizations



## [Bioblast alert 2013\(3\)](#)

- **MiP2013: Comparative Mitochondrial Physiology:** The Book of Abstracts is available of the 9th MiP"conference" >>> Open Access  
Laner V, Bidaurratzaga E, Gnaiger E (2013) Comparative Mitochondrial Physiology. MiP2013. Mitochondr Physiol Network 18.08: 96 pp.  
[http://www.bioblast.at/index.php/Laner\\_2013\\_Mitochondr\\_Physiol\\_Network\\_MiP2013](http://www.bioblast.at/index.php/Laner_2013_Mitochondr_Physiol_Network_MiP2013)
  - A MiP*conference* dedicated to Kjell Johansen and Peter Hochachka - in the spirit of global networking rooted in the pioneering work of August Krogh;
  - contributions by John E Walker, Vladimir P Skulachev, Anibal E Vercesi, Hong Kyu Lee and many more outstanding mitochondrial physiologists;
  - a MiP*session* on "Tissue differences in *diabesity* - mouse and rat" (MiPathology C2).
- **MitoPedia news: MiPMap** and comparative mitochondrial physiology - initiation of a project on mt-properties in cell types, tissues and species.
  - **Comparative mitochondrial physiology** – publications in the MiPMap.
  - [http://www.bioblast.at/index.php/Comparative\\_MiP\\_publications:Species,tissues,cells](http://www.bioblast.at/index.php/Comparative_MiP_publications:Species,tissues,cells)
- **MitoPedia Glossary:** Normalization of mitochondrial respiration - a simple solution to an old problem?
  - [http://www.bioblast.at/index.php/Flux\\_control\\_factor](http://www.bioblast.at/index.php/Flux_control_factor)

## [Bioblast wiki](#)

**Bioblast** was launched on 2010-07-12 as a glossary and index in mitochondrial physiology (**MitoPedia** [1]) – it is meant to be an innovative, self-developing database – in the spirit of **Gentle Science**. A **wiki** is "the simplest online database that could possibly work" [2].

- The Bioblast start page has been accessed 194,024 times (2013-09-18; 18:18 Central European Time).
- 993 O2k-Publications are listed on Bioblast, and can be sorted in the MiPMap (2013-09-18).

[1] The term MitoPedia is a portmanteau from Mitochondria and encyclopedia.

[2] Cunningham, Ward, [What is a Wiki](#), WikiWikiWeb, <http://www.wiki.org/wiki.cgi?WhatIsWiki> 2010-09-09